Remarks/Arguments

Applicant has carefully considered the rejections in the previous office action and submits the following arguments, which are believed to place the application in condition for allowance.

Rejection Under 35 U.S.C. § 112

The examiner rejected claims 36 and 37 as indefinite under 35 U.S.C. § 112, second paragraph, on the grounds that "it is unclear what structure would necessarily go to make up a 'blue flame detector.'" Office Action, p. 5.

Response

The examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. When the examiner is satisfied that patentable subject matter is disclosed, and it is apparent to the examiner that the claims are directed to such patentable subject matter, he or she should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, but should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement.

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

(A) The content of the particular application disclosure;

(B) **The teachings of the prior art**; and

(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent. MPEP 2173.02 (emphasis added).

Submitted herewith is a printout resulting from an internet search for "blue flame detector," modified to "UV flame detector." As evidenced by the numerous suppliers listed on the printout, persons of ordinary skill in the art would have known that there were numerous suppliers of known equipment for detecting a blue flame. Persons of ordinary skill in the art therefore would have understood the scope of claims 36 and 37.

Applicant respectfully requests that the rejection of claims 36 and 37 as indefinite under 35 U.S.C. § 112, second paragraph, be withdrawn.

Rejection of claims 22-44

The examiner rejects new claims 22-44 as obvious over Suppes in view of Chen, Wittenbrink, Berlowitz, Tanasawa, GB 2215032A (Shin), Air Resources Board California Diesel Risk Reduction ("CARB"), Shell Middle Distillate Process (Eiler, et al, hereafter "SMD"), U.S. 20020020107 to Bailey, et al ("Bailey"), and EPS: Clean Alternative Fuels ("EPS"). The examiner maintains the arguments presented previously with respect to many of these references. The examiner contends that SMD provides motivation to look to F-T derived fuels. According to the examiner, SMD "expressly highlights both kerosene and gas oil Fischer-Tropsch derived fuels have exceptional qualities (e.g. –free from impurities such as nitrogen and sulphur and from aromatic species; excellent combustion properties-smoke point and cetane number – and show very low particle emissions)." The examiner contends that "issues concerning safety as well as **issues related (sic) environment pollution would have indeed been the motive for persons having**

ordinary skill in the art of combustion to select and or bring together already known techniques for mitigating unwanted environmental pollution" such as those allegedly in the references. Office Action, p. 11 (emphasis added).

According to the examiner, "[a] person having ordinary skill in the art would have at the time of the invention readily appreciated the similarities between and readily substitute[d] suitable alternative liquid fuels, such as kerosene and Diesel fuel, [where] there is a reasonable expectation of success." *Id.* The examiner directs Applicant's attention to Shin. The examiner recognizes that Shin "acknowledg[es] certain drawbacks of using high ignition point liquid fuels (i.e. – kerosene and Diesel fuel) in portable space heaters," but "recognizes kerosene and Diesel fuels as interchangeable and suitable equivalent fuels for use in space heaters." According to the examiner, Shin teaches that "increased efficiency and lowered environmental pollutants result when applying suitable preheating and gasifying techniques to the combustion of kerosene and Diesel fuels." *Id.*

Response

-Summary

The current rejection of the pending claims **grossly oversimplifies** the operational and compatibility concerns confronting inventors attempting to operate existing equipment using alternative fuels at the time the invention was made.

Applicant already has explained why the examiner has not pointed to a teaching or suggestion of every limitation of the claims in the cited references. Applicant will not repeat all of the relevant arguments here.

To the extent that the examiner maintains the rejection, the examiner is contending that it would have been **"obvious to try"** using the claimed low density liquid F-T derived products to operate yellow flame burners. Whether or not the examiner can establish that it would have been obvious to try the claimed process is a question of fact. In order to meet his burden of proof, the examiner must establish that there was "a reasonable expectation of success." *Pfizer Inc. v. Apotex Inc.*, 82 U.S.P.Q.2d 1321, 1333-34 (Fed. Cir. 2007).

As seen from the following discussion, the examiner has not met this burden. The examiner has not established that (a) a PHOSITA[1] would have known the relevant operational and/or compatibility concerns related to operating yellow flame burners in existing home heating equipment using fuel comprising the claimed low density F-T derived fuel, and (b) a PHOSITA would have known how to resolve any such relevant operational and/or compatibility concerns.

-Discussion

As an initial matter, a fairly consistent body of caselaw from the United States Court of Appeals for the Federal Circuit (the "Federal Circuit") repeatedly emphasizes that "obvious to try" is not the appropriate standard for obviousness under 35 U.S.C. §103. *In re O'Farrell*, 7 U.S.P.Q.2d 1673, 1680 (Fed. Cir. 1988). The "obvious to try" test is improper because it ignores problem recognition as an element of the obviousness inquiry. *Gillette Co. v. S.C. Johnson & Son*, 16 U.S.P.Q.2d 1923 (Fed. Cir. 1990); *In re Fine*, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988); *In re Geiger*, 2 U.S.P.Q.2d 1276 (Fed. Cir. 1987); *Hybritech Inc. v. Monoclonal Antibodies Inc.*, 231 U.S.P.Q. 81 (Fed. Cir. 1986); *In re Merck & Co.*, 231 U.S.P.Q. 375 (Fed. Cir. 1986); *Jones v. Hardy*, 220 U.S.P.Q. 1021 (Fed. Cir. 1984).

Some have questioned whether this fairly consistent body of Federal Circuit caselaw was essentially overruled by the 2007 decision of the United States Supreme Court (the "Supreme Court") in *KSR Int'l Co. v. Teleflex Inc. KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. __, 82 U.S.P.Q.2d 1385, 1397 (2007). **As seen from the following discussion, the Supreme Court in *KSR* did nothing more than criticize the Federal Circuit's analysis of the facts in that case.**

In *KSR*, the Supreme Court stated that:

> The same constricted analysis led the Court of Appeals to conclude, in error, that a patent claim cannot be proved obvious merely by showing that the combination of elements was "obvious to try." * * * When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the

[1] Person Having Ordinary Skill In The Art.

> anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

KSR, 82 U.S.P.Q.2d at 1397.

In another 2007 decision, the Supreme Court made it clear that "obvious to try" is a fact issue:

> [T]his court has . . . struggled to strike a balance between the seemingly conflicting truisms that, under 35 U.S.C. § 103, "obvious to try" is not the proper standard by which to evaluate obviousness, but that absolute predictability of success is not required. Reconciling the two is particularly germane to a situation where, as here, a formulation must be tested by routine procedures to verify its expected properties. The question becomes then, when the skilled artisan must test, how far does that need for testing go toward supporting a conclusion of non-obviousness?
>
> As we have said before, "**[e]very case**, particularly those raising the issue of obviousness under section 103, **must necessarily be decided upon its own facts.**" Consequently, courts cannot decide the obviousness or non-obviousness of a patent claim by proxy. **Undue dependence on mechanical application of a few maxims of law, such as "obvious to try," that have no bearing on the facts certainly invites error as decisions on obviousness must be narrowly tailored to the facts of each individual case.** (Citations omitted.)

Pfizer Inc. v. Apotex Inc., 82 U.S.P.Q.2d 1321, 1333-34 (Fed. Cir. 2007) (emphasis added).[2] Cases decided since *KSR* agree that the "obvious to try" issue is a question of fact.[3]

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[2] The Federal Circuit noted that:

> this is not the case where the prior art teaches merely to pursue a "general approach that seemed to be a promising field of experimentation" or "gave only general guidance as to the particular form of the claimed invention or how to achieve it." *O'Farrell*, 853 F.2d at 903; *Medichem*, 437 F.3d at 1167. Here, as admitted by Mr. Davison, in selecting an acid addition salt formulation, one skilled in the art looked to pharmacopoeias and compendia to find a salt that was previously approved by the FDA and used successfully within the pharmaceutical industry.

Pfizer Inc. v. Apotex Inc., 82 U.S.P.Q.2d at 1334.

The Federal Circuit has given detailed guidance regarding whether several fact situations establish that an invention would have been "obvious to try." In those factual situations, the references provided:

(1) motivation to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful;

(2) motivation to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it; or

(3) contained detailed enabling methodology for practicing the claimed invention, a suggestion to modify the prior art to practice the claimed invention, and evidence suggesting that it would be successful.

The Federal Circuit concluded that, in situations (1) and (2) the invention would be nonobvious, while in situation (3) the invention would be obvious. *In re O'Farrell*, 7 U.S.P.Q.2d at 1673. The foregoing conclusions are consistent with *KSR*.

Applicant expressly does not admit that the cited references would motivate a person of ordinary skill in the art to supply F-T derived fuel to a yellow flame burner, for all of the reasons previously given. However, assuming for purposes of argument only that the references did provide such motivation, the facts of the present case would most closely align with *O'Farrell* fact situation (2). *Id.* In other words, the references (at most) would motivate a person of ordinary skill in the art:

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[3] In one case, the Federal Circuit distinguished *KSR* on the simple basis that the combination in question was not obvious to try. *Takeda Chem. Indus. Ltd. v. Alphapharm Pty. Ltd.*, 83 U.S.P.Q.2d 1169, 1176 (Fed. Cir. 2007) ("Rather than identify predictable solutions for antidiabetic treatment, the prior art disclosed a broad selection of compounds any one of which could have been selected as a lead compound for further investigation. Significantly, the closest prior art compound (compound b, the 6-methyl) exhibited negative properties that would have directed one of ordinary skill in the art away from that compound. Thus, this case fails to present the type of situation contemplated by the Court when it stated that an invention may be deemed obvious if it was 'obvious to try.' The evidence showed that it was not obvious to try.") In another case, the claims were found to be obvious based, at least in part, on admissions in the specification. *PharmaStem Therapeutics Inc. v. ViaCell Inc.*, 83 U.S.P.Q.2d 1289, 1304 (Fed. Cir. 2007).

(2) to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.

Id. Fact situation (2) would not give rise to a case of *prima facie* obviousness **UNLESS the *examiner* establishes a reasonable expectation of success.** *Pfizer Inc. v. Apotex Inc.*, 82 U.S.P.Q.2d 1321, 1333-34 (Fed. Cir. 2007). *See also In re Deuel*, 34 U.S.P.Q.2d 1210 (Fed. Cir. 1995) and *Medichem S.A. v. Rolabo S.L.*, 77 U.S.P.Q.2d 1865, 1870 (Fed. Cir. 2006). The examiner has not met this burden.

Applicant established that yellow flame burners operate differently than automotive engines. Nevertheless, many of the references cited by the examiner relate to fuels to be burned in automotive engines, particularly compression ignition engines. The examiner has not established that these references related to burning diesel fuels in automotive engines establish a reasonable probability that a yellow flame burner could be operated successfully using a feed comprising the claimed low density F-T derived fuel.

The examiner contends that Shin teaches that "increased efficiency and lowered environmental pollutants result when applying suitable preheating and gasifying techniques to the combustion of kerosene and Diesel fuels." Office action, p. 11. What Shin establishes is that preheating and gasifying techniques (and in some cases equipment) are required even to use Shin's stove to effectively burn Diesel fuel. **Shin establishes that one cannot simply substitute one fuel for another as a feed to existing equipment without expecting that the process and/or equipment would need to be modified.**

In fact, inventors attempting to substitute an alternative fuel for some or all of a petroleum derived fuel as a feed to existing equipment face many operational and compatibility concerns. **Identification of the operational and compatibility concerns is a part of the problem recognition element of the invention.**

Perhaps the best example of such operational and compatibility concerns are those encountered during the development of F-T derived diesel fuels, where:

- the F-T fuel produced a **relative lack of elastomer swelling compared with conventional fuels** that could potentially cause problems in-service, because of potential seal deterioration;
- the F-T fuel was **unresponsive to conventional cold flow additives;**
- the F-T fuel produced some **power loss and some volumetric fuel consumption loss** that would be perceived by drivers of conventional diesel vehicles;
- the F-T fuel produced **lubricity issues** which could result in rapid failure in vehicles with fuel pumps sensitive to lubricity when operating with F-T fuel, alone; and,
- the F-T fuel tended to produce **peroxides, which could deteriorate elastomers**

There was no reasonable expectation that a diesel engine could be successfully operated using a fuel comprising the claimed low density F-T derived diesel fuel until these design and compatibility concerns were (a) identified, and (b) resolved.

The same is true here. There was no reasonable expectation that yellow flame burners in existing home heating equipment could be successfully operated using fuel comprising the claimed low density F-T derived fuel until design and compatibility concerns were (a) identified, and (b) resolved.

In order to establish a reasonable expectation of success, **the examiner has the burden** to establish that (a) a PHOSITA would have known the relevant operational and/or compatibility concerns related to operating yellow flame burners in existing home heating equipment using fuel comprising the claimed low density F-T derived fuel, and (b) a PHOSITA would have known how to resolve any such relevant operational and/or compatibility concerns.

For all of the foregoing reasons, Applicant respectfully requests reconsideration and allowance of all of the pending claims.

-Claims 39 and 42

The examiner certainly has not established that claims 39 and 42 are obvious. Claims 39 and 42 specify "burning the one or more liquid Fischer-

Tropsch product using the yellow flame burner under conditions comprising a value of lambda of from about 1.05 to about 1.2." The examiner has not pointed to any teaching or suggestion that any superior results could be achieved by using the claimed lambda. The claims nevertheless require "produc[ing] improved flue gas comprising 100 mg/kWh or less carbon monoxide and 150 mg/kWh or less NO_x." Claims 39 and 42.

The examiner clearly has not pointed to a teaching or suggestion of the limitations of claims 39 and 42 in the cited references. The examiner has not established an apparent reason to combine the references in the fashion claimed. Nor has the examiner established a reasonable expectation that operating the yellow flame burner in the fashion claimed could achieve the claimed results.

Applicant respectfully requests that the rejection of claims 39 and 42 be withdrawn for the foregoing additional reasons.

CONCLUSION

Applicant respectfully reconsideration and allowance of the claims. If the examiner finds the application other than in condition for allowance, the examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 334-5151 x 200 to discuss the steps necessary for placing the application in condition for allowance. The Commissioner is hereby authorized to charge any fees in connection with this paper, or to credit any overpayment, to Deposit Account No. **19-1800 (File No. TS8577)**, maintained by Shell Oil Company.

Respectfully submitted,

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Sierra Monitor Corp. - Milpitas, CA
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http://www.ametekpower.com/products/Product.cfm?Product_Id=4235
Company Profile: ISO 9001 certified manufacturer & designer of UV/IR (ultraviolet & infrared) flame detectors & sensors. Features include robust, compact design, anodized aluminum construction, on/off indication & two-wire loop powered installation. Specifications include output 4 to 20 mA with 250 ohms maximum...

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Brand Names: Siemens

Thomas Industrial Services, Inc. - Milwaukee, WI
Distributor, Manufacturer, Service Company
Company Profile: ISO 9001:2000 & ISO 17025:1999 certified custom manufacturer & distributor of UV/IR flame detectors. Features of UV/IR flame detectors include resistance to short circuit, various operating temperature range, integral thread collar with 1/2 in. NPT female threads & replaceable ultraviolet cell....
Brand Names: Hauck, Honeywell, Maxon

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Scott Bacharach - Exton, PA
Manufacturer
Company Profile: Manufacturer of gas detection devices.

Best Lab Deals - Garner, NC
Distributor, Manufacturer, Service Company
Company Profile: Distributor of detectors including ammonia, anthrax, blood flow, carbon dioxide, carbon monoxide, flame, IR, UV & gas. Features include thermostatted heater block, electronic pressure controlled support gases & internal amplifier electronics.

Pneuline - Havertown, PA
Distributor, Service Company
Company Profile: Distributor Of Automatic Temperature Controls, Building Automation Supplies

Net Safety Monitoring Incorporated - Calgary, AB CAN
Manufacturer, Service Company
Company Profile: Manufacturer of flame information detectors. Product provides UV, IR, UV/IR, Triple-IR explosion-proof flame/fire detection & is immune to sunlight, lightning & black body radiation.

GE Energy - Twinsburg, OH
Manufacturer
Company Profile: Solid State Flame Detectors. Long Life Silicon Carbide Flame Detectors Are 10 Times More Sensitive Than Other Gas Filled UV Sensors

General Monitors - Lake Forest, CA
Manufacturer
Company Profile: Flame detectors for flame monitoring. Flame detectors feature continuous optical path monitoring combined with flicker discrimination circuitry to ensure the highest level of protection with exceptional immunity to false alarms.

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T.F.Campbell Company, Inc - Pittsburgh, PA
Distributor, Service Company
Company Profile: Distributor of automatic controls, control systems, components, & parts for HVAC, plumbing, industrial, & building energy management applications, including gas detectors, IR & UV flame detectors, flame rods, flame safeguard controls, & pilot lights.

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